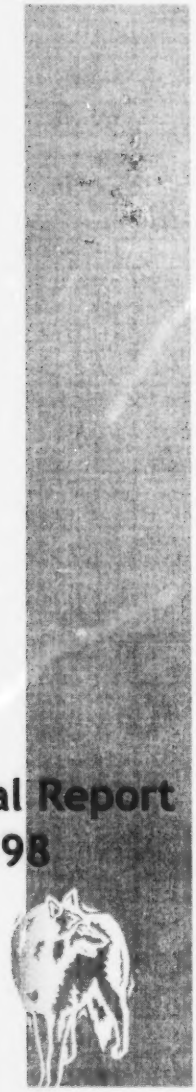
# West Kitikmeot Slave Study Society



**Annual Report 1997-98**

West Kitikmeot Slave Study Society
Annual Report 1997-98

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March 31, 1998

West Kitikmeot / Slave Study Partners

Dear Partners,

On behalf of the West Kitikmeot / Slave Study Society I am pleased to present to each of you the annual report for the second year of the Study. This report covers the fiscal year from April 1, 1997 to March 31, 1998 as well as providing some of the history leading up to the formation of the Society.

This year marked the submission and public release of the first research reports. The results were of great interest to all of the Partners as well as the communities you each represent, and the many individuals and organizations who have closely followed the path of development in the West Kitikmeot / Slave area. I want to thank each of the individuals and organizations involved in carrying out and reviewing the research for their dedication and excellent performance.

I think that everyone will agree that our second year lived up to all expectations created by the first. Congratulations on another successful year.

Yours truly,

Larry Pokok Aknavigak
Chair

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# West Kitikmeot/Slave Study Management Board 97/98

| | |
|---|---|
| **Chair:** | Larry Aknavigak<br>Chairman, Nunavut Impact Review Board (independent chairperson of the West Kitikmeot / Slave Study Society) |
| **Past Chair:** | Ted Blondin<br>Land Claims Manager, Dogrib Treaty 11 Council<br>representing Dogrib Treaty 11 Council |
| **Vice Chair:** | Robert McLeod<br>Assistant Deputy Minister (West), Department of Resources, Wildlife and Economic Development)<br>representing the Government of the Northwest Territories |
| **Secretary-Treasurer:** | Richard Weishaupt<br>Manager, Community Affairs, Diavik Diamond Mines<br>representing the Northwest Territories Chamber of Mines |
| **Member:** | Chief Florence Catholique<br>Chief, Lutselk'e Dene First Nation<br>representing Lutselk'e Dene First Nation |
| **Member:** | James Eetoolook<br>1st Vice-President, Nunavut Tunngavik Inc.<br>representing Inuit Organizations |
| **Member:** | David Livingstone<br>Director, Renewable Resources and Environment Directorate, Department of Indian Affairs and Northern Development, representing the Federal Government |
| **Member:** | Kevin McCormick, Chief, Northern Conservation Division, Environment Canada<br>representing Nunavut Co-Management Organizations |
| **Member:** | Kevin O'Reilly<br>Research Director, Canadian Arctic Resources Committee<br>representing Environmental Organizations (resigned August 1997) (replaced in April 1998 by William Carpenter, Regional Coordinator for the Western NWT, World Wildlife Fund) |
| **Member:** | Mike Paulette<br>Vice-President, Metis Nation of the Northwest Territories<br>representing Metis Nation of the Northwest Territories |

**Study Office**

John McCullum, Study Director
Peter Cullen, Study Assistant (replaced Pearl Benyk in August 1997)
James Marlowe, Study Assistant (left in June 1997)

# WEST KITIKMEOT / SLAVE STUDY
# PARTNERS' ACCORD

**The Vision** of the Partners is to achieve sustainable development in the West Kitikmeot / Slave Study area which respects aboriginal cultural values, so that the land is protected, culture is preserved, and community self sufficiency / reliance is enhanced.

**The Goal** of the Study is to collect and provide information for the West Kitikmeot / Slave area to assist informed decision making by the partners, and to facilitate sustainable development.

It is essential that the Partners translate the vision, goal and objectives of the West Kitikmeot / Slave Study into action, and that we develop and maintain a framework for an ongoing relationship.

**Therefore we, the undersigned representatives of the Partners on the Management Board, undertake to pursue the following objectives, to:**

- provide an information base necessary for Study partners to make sound resource management decisions
- provide a basis for the identification and assessment of cumulative effects for planning and development purposes
- provide a forum in which to share information on issues, while respecting the diversity of interests: aboriginal, industry, environmental organizations, governments, and the public
- provide the information necessary to enhance the understanding of potential impacts of exploration and development on ecological processes and communities
- support a central role for both traditional knowledge and scientific knowledge, and facilitate the linkage of research carried out in these systems
- ensure the accessibility of Study research results and information to all Partners and the public, while respecting the confidentiality of certain information
- maximize community research training opportunities and the use of community resources in all Study research

**We, the representatives of the Partners on the Management Board,** sign and endorse this Accord as a symbol of our commitment to the West Kitikmeot/Slave Study, its vision, goal, and objectives.

Treaty 11

Northern Environmental Coalition

Lutsel k'e and Yellowknives

NWT Chamber of Mines

Nunavut Co-management organizations

Government of the Northwest Territories

Inuit organizations (NTI, KIA, KHTA)

DIAND

Metis Nation of the Northwest Territories

**Witnessed by:**

December 14th, 1995

# Acknowledgments

The West Kitikmeot / Slave Study relies on the strength of its partnership with the people and organizations which have a direct interest in understanding and managing the resources of the West Kitikmeot / Slave area. The Study has received strong support from all its Partners as well as from many organizations and individuals who are simply interested in helping the study achieve its goals. The support received has come in as many forms as the variety of individuals prepared to help out. These include people from communities and aboriginal organizations, within both governments, the mineral exploration and development sector, environmental organizations, research organizations and institutes and many interested individuals. Such people are from all walks of life: researchers, hunters, administrators, politicians, business people, advocates and many others. The Society would like to thank all those people for their interest and support, and encourage them to continue to assist, inquire about and support this work.

The Study would particularly like to acknowledge the many independent experts who reviewed each project's annual report anonymously and on their own time to ensure that the information we released publicly was accurate and unbiased.

None of the research can take place without funding, and so we would particularly like to acknowledge those organizations who made generous contributions during 1997 - 98:

**Major Contributors**

(over $100,000)

BHP Diamonds Inc.
Diavik Diamond Mines Inc.
Government of Canada
Government of the Northwest Territories

**Significant Contributors**

($10,000 to $100,000)

BHP Minerals Inc.
Echo Bay Mines Ltd.
Kennecott Exploration Ltd.
Lytton Minerals Limited
Monopros Limited
Nunavut Tunngavik Inc.
Nunavut Wildlife Management Board

**Supporting Contributors**

(under $10,000)

Air Tindi
Boart Longyear
Canadian North Airlines
Canamera Geological Ltd.
Golder Associates
Great Slave Helicopters
Kitikmeot Inuit Association
Kugluktuk Angoniatit Association
Nishi Khon/PCL
Nunavut Impact Review Board
Penner and Associates
Placer Dome Canada
Robinson's Transport Limited
SouthernEra
University of Saskatchewan
Winspear Resources
World Wildlife Fund Canada

*Larry Aknavigak, Chair, West Kitikmeot/Slave Study Society*

# Chair's Message

This last year chairing the West Kitikmeot / Slave Study's Management Board has left me with a tremendous respect for the Partners and the Study. Our partnership, which is one of our most remarkable achievements, has grown and strengthened over this last year, and the work of the Management Board and Committee members has been a source of inspiration and motivation for me. I commend you on the strong spirit of cooperation and shared purpose among all the Partners.

As I look around the table at our meetings I am always impressed by the quality and depth of the individuals involved. Your dedication, and the commitment of the organizations you represent, is a strong statement of belief in the possibility of positive, sensible, cooperative development of the North. Every Partner has done their best to ensure that research funded by the Society, whether traditional or western, will be worthwhile, useful and above all, reliable.

This second year begins to bring the rewards of all the hard work as research results are released. And the results are showing that when we combine the wisdom and knowledge of aboriginal peoples, who have lived in the North for thousands of years, with western scientific knowledge gathered using sound, up-to-date methods, what we come up with is more than the sum of its parts. We develop an understanding that is multi-faceted, richly detailed and inclusive.

However the Board has not been content to sit back and reap these rewards. They have continued to identify key areas of research and developed workable solutions to difficult issues.

My message would not be complete without a word about the Study Office which does so much to support us in our work. The staff have taken our direction and made it work on the ground while ensuring that we are informed and prepared for each decision. They are an important part of this team.

There can be no doubt that the Study's second year has equaled the success of the first year. Our research program is well established and the pieces are beginning to form a larger picture. I have no doubt that our Board, committees and staff will continue to drive the Study toward producing the best information for making sound decisions about the future of the West Kitikmeot / Slave area.

Larry Pokok Aknavigak

Chair

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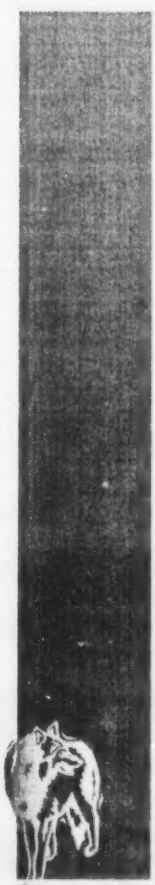
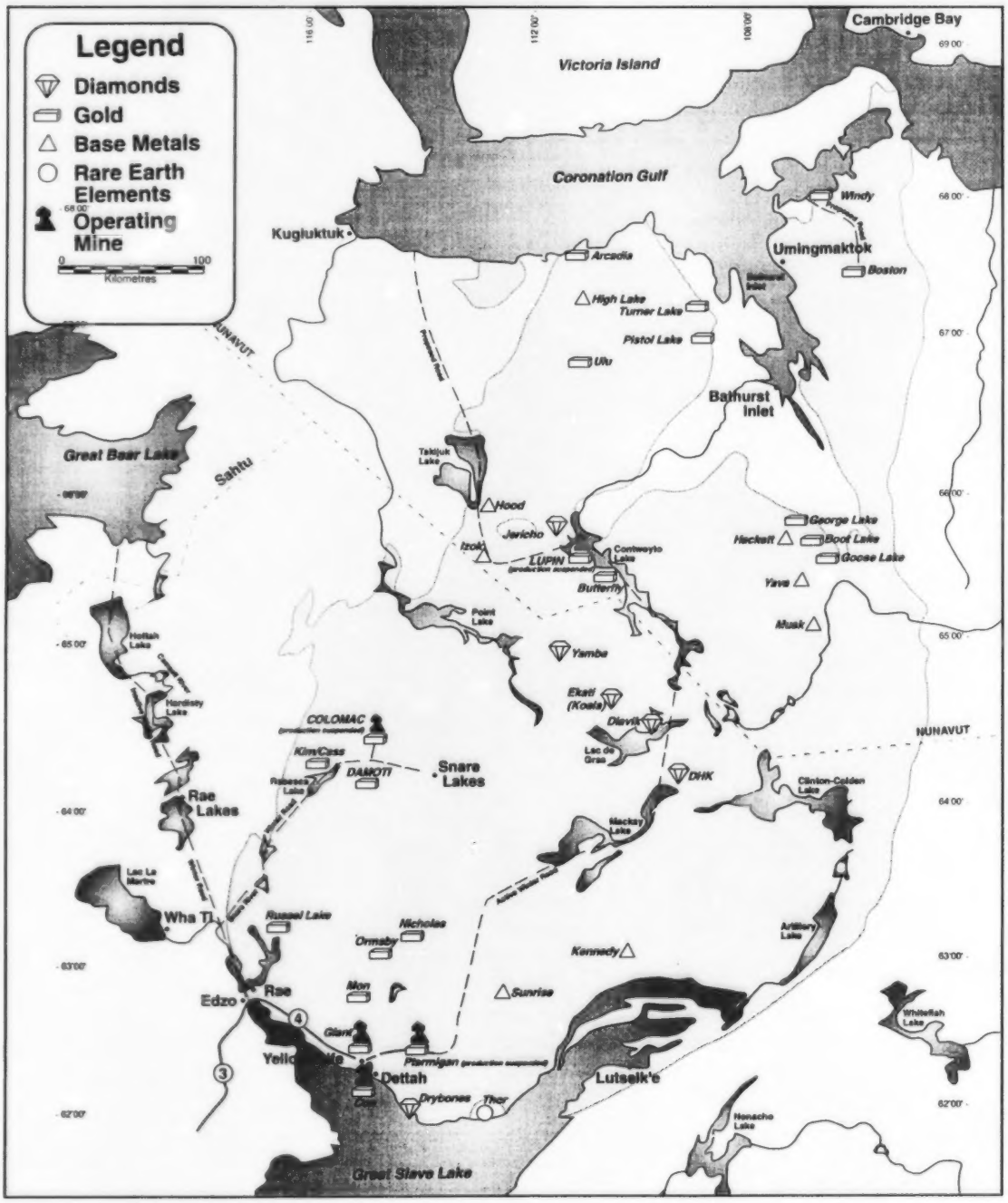


# Map of WKSS Area

**West Kitikmeot/Slave Study Area**

**Northwest Territories, Canada**



# Introduction

The West Kitikmeot / Slave Study Society was formally registered on January 18, 1996. The Society is collecting and providing information on the effects of development in the West Kitikmeot / Slave area to the nine Partners for their use in making informed decisions. Each of the nine Partner organizations, which represent a broad range of interests in the Study area, has a seat on the Society's Management Board:

- Dogrib Treaty 11 Council
- Lutselk'e Dene First Nation
- Metis Nation of the Northwest Territories
- Inuit Organizations

  representing

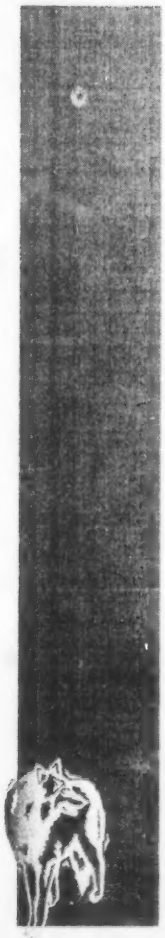
  - Kitikmeot Hunters' and Trappers' Association
  - Kitikmeot Inuit Association
  - Nunavut Tunngavik Incorporated
- Nunavut Co-management Organizations

  representing

  - Nunavut Impact Review Board
  - Nunavut Planning Commission
  - Nunavut Water Board
  - Nunavut Wildlife Management Board
- Federal Government
- Government of the Northwest Territories
- Northwest Territories Chamber of Mines
- Environmental Organizations

Before establishing the Society, the Partners developed Terms of Reference for the five-year Study, including a vision statement, the goal, objectives and a management structure. The Terms of Reference set up a three-way funding partnership consisting of the Federal government, the Territorial government and the Industry / Aboriginal / Environmental organizations. The Governments will match funding contributed by the other organizations to a maximum of $750 thousand per year each, or $2.25 million per year total. Researchers make study proposals to the Society and the Management Board decides whether or not to approve these applications and how much funding to provide.

The Partners developed a comprehensive Research Strategy to guide them in choosing amongst proposals. The Strategy sets out the Study Research Questions, covering Physical and Environmental Research and Socio-Economic Research. Please see the list of questions on pages 26 and 27. The Partners have agreed that Scientific and Traditional Knowledge are both important sources of information and that studies conducted under the auspices of the Society should link these two types of knowledge.



The Partners have also agreed that communication is an essential part of the Study process. The Study Office will make information collected as part of the Study available to the public. The Study Office has developed a Communications Strategy and has established communications with a wide variety of individuals and organizations who may be interested in the Study and its results. In particular, the communications efforts target local communities and present information in a way that will be useful and interesting to them.

While the initial study area was defined as the Slave Geological Province, the Partners soon realized that the region would have to include zones and communities most directly affected by development in the Province, so the study area is now more loosely defined as the West Kitikmeot/Slave area.

# Background

The West Kitikmeot / Slave area is vast, covering roughly 200,000 square kilometers of land and water, rivers and lakes in the Slave Geological Province as well as a number of communities which depend on the resources of the area to live and prosper. The area has been occupied and used by Aboriginal peoples for thousands of years, making their living from the land. In more recent times the fur trade, religious institutions, government and the mineral industry have shaped development in the area through the establishment of trading posts, churches and schools, communities and operating mines.

The West Kitikmeot / Slave area includes large parts of two of Canada's major ecozones: the Taiga Shield and the Southern Arctic, with the tree line running northwest to southeast between them, dividing the area roughly in half. The Bathurst Caribou herd, numbering 350,000, roams freely, calving, migrating and wintering almost entirely within the area. In addition, grizzly bear, musk-ox, wolves, moose and a variety of furbearers make their homes here. Huge populations of migratory waterfowl, shorebirds and songbirds spend the summer months throughout Canada's north, and many of them are found here part or all of that time. Substantial fisheries are found in many of the lakes and rivers. The pristine environment and abundance of wildlife have attracted tourists and sportsmen, and a tourism/outfitting industry to meet their needs.

By world standards the West Kitikmeot / Slave area is largely undeveloped. However the development potential is high, particularly for minerals. There are several operating gold mines, largely in the southern sections, as well as numerous deposits with development potential dotted throughout the area, largely gold, diamonds and base metals. There are a number of hydroelectric developments and potential sites. With the discovery of diamonds in the middle of the West Kitikmeot / Slave area at Lac de Gras in the early 1990's, one of the largest staking bonanzas in the history of the world began, and within a few years virtually the entire area was subject to mineral claims. Following on the high levels of exploration activity, a number of sites are in advanced exploration stages and the BHP Diamonds Project at Lac de Gras entered the construction phase in 1997-98.

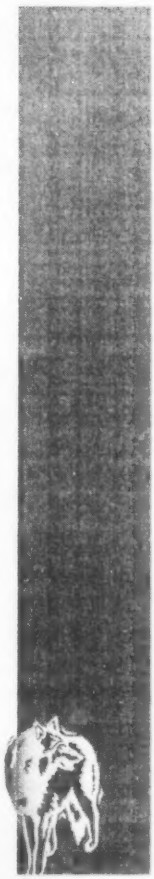
The West Kitikmeot / Slave Study was conceived during the early stages of the diamond staking rush as the extent of exploration and possible development became clear. Concerns were voiced by many organizations and individuals, especially aboriginal and environmental groups, about the pace of exploration and possible effects of development. All parties, including industry and governments, recognized the need for an improved information base in order to predict future changes, particularly information about the effects of multiple developments on the environment and the people in the area. All agreed that Traditional Knowledge and Scientific Knowledge would both be required to adequately meet these information needs. The West Kitikmeot / Slave Study was formally announced in a joint statement by the Minister of Indian Affairs and Northern Development, Government of Canada and the Minister of (then) Renewable Resources, Government of the Northwest Territories on December 9th, 1994. The Study was to last five years, with funding provided by the federal and territorial governments to match the combined contributions of the industry/aboriginal/environmental Partners.

A number of meetings and workshops were held involving representatives from the various Partner organizations. A West Kitikmeot / Slave Study Working Group was established, leading up to a meeting in Cambridge Bay in September 1995 where all the Partner organizations agreed on a basic management structure and set out the basis for the Terms of Reference for the overall Study. The Cambridge Bay meeting mandated a Transition Working Group to continue the process of implementing the Study, culminating in the signing of a Partners' Accord on December 14th, 1995 and confirming the commitment of all Partners to the Vision, Goal and Objectives of the Study (the Study Terms of Reference, including Vision Statement, Goals and Objectives are in Appendix A). At that time the Partners agreed to form a Society for the purposes of carrying out the West Kitikmeot / Slave Study and an application to register the West Kitikmeot / Slave Study Society was filed the same day. The Management Board met for the first time immediately following the signing of the Partners' Accord to establish a Secretariat and begin putting the Study into operation.

The Management Board directed that a Research Strategy Workshop be held to guide the setting of research priorities and the development of a proposal review process. The workshop, held at the end of February 1996, was attended by representatives of all the Partners. The workshop results provide the basis for all research to be conducted under the West Kitikmeot / Slave Study.

At the March 26, 1996 Management Board meeting it was decided that a Traditional Knowledge Steering Committee and a Project Steering Committee be formed to review and recommend a final research strategy and to review project proposals for relevance to the research priorities and for research quality. Since that time the research priorities have been refined and a specific set of research questions have been developed.

The West Kitikmeot / Slave Study formally began on April 1, 1996 and will continue for five years until March 31, 2001.



*Richard Weishaupt,*
*Secretary-Treasurer, West Kitikmeot/Slave*
*Study Society*

# Treasurer's Message

The Society's fundraising partnership of industry, aboriginal and environmental organizations raised almost $600,000 for research in 1997-98. This amount triggered matching funds from the federal and territorial governments, under the Study's matched funding arrangement, which were sufficient to cover all the approved research. Thanks are due to the fundraising efforts of the Partners, and to the many contributors.

The Society fully expended all revenue generated from Partners in 1997-98, although a small surplus resulted from revenue generated from other sources.

Partners should note that substantial amounts of funding were contributed directly to individual research projects rather than the Society. These funds are not included in the audited financial statements in Appendix B, but are summarized below on pages 6 and 7.

Richard Weishaupt

Secretary-Treasurer

# Financial Information

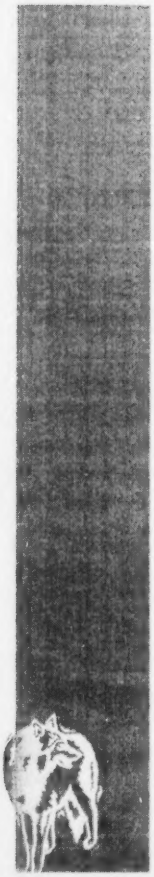
The budget for the period from April 1, 1997 until March 31, 1998 was $2.25 million with the Society actually generating slightly less than $1.8 million. Uses of these funds in the fiscal year totaled slightly more than the full value of Partner contributions, although additional revenue generated from other sources resulted in a small surplus overall.

Audited statements of revenue and expenditures for the Study which were under the control of the Society are provided in Appendix B. Revenue and expenditures reported here are considered unaudited because they include contributions made directly to research projects and associated expenditures, which are not under the control of the Society and therefore not audited.

**Sources and Uses of Funds (unaudited) for the year ended March 31, 1998**

**Sources of Funds (unaudited)**

| | | | |
|---|---|---|---|
| Government of the Northwest Territories | | | $ 594,390 |
| RWED | $ | 567,340 | |
| Public Works | $ | 26,000 | |
| ECE | $ | 1,050 | |
| Government of Canada | | | $ 594,390 |
| DIAND | $ | 578,490 | |
| PCSP | $ | 15,900 | |
| Industry/Aboriginal Environmental Partnership | | | $ 594,390 |
| Diavik Diamond Mines | $ | 237,386 | |
| BHP Diamonds | $ | 108,001 | |
| Lytton Minerals | $ | 65,000 | |
| Nunavut Tunngavik Inc | $ | 50,000 | |
| BHP Minerals | $ | 36,940 | |
| Nunavut Wildlife Management Board | $ | 20,000 | |
| Kennecott Exploration | $ | 15,000 | |
| Monopros | $ | 15,000 | |
| Echo Bay | $ | 10,830 | |
| Canamera Geological | $ | 9,000 | |
| Placer Dome Canada | $ | 5,000 | |
| Boart Longyear | $ | 4,000 | |
| Winspear Resources | $ | 3,000 | |
| Canadian North | $ | 2,540 | |
| University of Saskatchewan | $ | 2,500 | |
| Golder Associates | $ | 2,000 | |
| Air Tindi | $ | 1,500 | |
| Great Slave Helicopters | $ | 1,500 | |
| Nishi Khon/PCL | $ | 1,000 | |
| SouthernEra | $ | 1,000 | |
| Kitikmeot Inuit Association | $ | 893 | |
| Nunavut Impact Review Board | $ | 500 | |
| Penner and Associates | $ | 500 | |
| Robinson's Transport Ltd. | $ | 500 | |



| | | | |
|---|---|---|---|
| World Wildlife Fund | $ 500 | | |
| Kugluktuk Angoniatit Association | $ 300 | | |
| Miscellaneous | | $ | 153 |
| Recovered | | $ | 12,186 |
| Investments | | $ | 5,414 |
| TOTAL | | $ | 1,800,923 |

**Uses of Funds**

| | | | |
|---|---|---|---|
| Study Office | | $ | 223,331 |
| Management Board Support | | $ | 43,140 |
| Research/Projects | | $ | 1,518,973 |
| TOTAL$ | | $ | 1,785,444 |
| Excess Revenue (unadjusted) | | $ | 15,479 |

**Statement of Expenditures (unaudited)**
for the year ended March 31, 1998

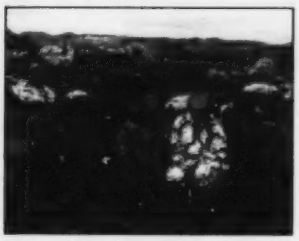
| | | | |
|---|---|---|---|
| Study Office | | $ | 223,331 |
| Management Board | | $ | 43,140 |
| Research/Projects | | $ | 1,518,973 |
| Caribou Seasonal Movements | $ 61,000 | | |
| Dogrib Traditional Knowledge of Caribou | $ 203,999 | | |
| Caribou Behaviour at Mine Sites | $ 36,380 | | |
| Calving Grounds | $ 69,285 | | |
| Grizzly Ecology | $ 312,140 | | |
| Wolverine Ecology | $ 94,000 | | |
| Eskers: Physical/Habitat | $ 157,196 | | |
| Lake Sediment/Water Quality | $ 14,000 | | |
| Community-Based Monitoring Traditional Knowledge | $ 33,086 | | |
| Implementation | $ 38,038 | | |
| On-Ice Drilling/Water Quality | $ 8,798 | | |
| Dogrib Traditional Knowledge of Habitat | $ 172,629 | | |
| Habitat Classification | $ 104,700 | | |
| Tuktu and Nogak | $ 46,183 | | |
| Fuel Inventory Amortization | $ 9,117 | | |
| Project Development | $ 124,200 | | |
| Caribou Task Force | $ 8,948 | | |
| State of Knowledge Report | $ 18,864 | | |
| Habitat Classification Evaluation | $ 6,410 | | |
| Sub-Total | | $ | 1,518,973 |
| TOTAL | | $ | 1,785,444 |

# The Study

The West Kitikmeot / Slave Study is unique; the first study of its type which recognized from its beginning the essential role of traditional knowledge to a holistic understanding of the environment. Study research projects will marry information from traditional knowledge holders and western science. The West Kitikmeot / Slave Study Management Board is also unique - a partnership of Inuit, Dene and Metis people living in the area, environmental organizations, the mining industry and the federal and territorial governments.

The Management Board of the West Kitikmeot / Slave Study Society has nine members and an independent chair. Representatives of the aboriginal Partners form a majority of the Board (five members) and choose the chair. In addition to the Board there are two committees which play a critical role in setting and monitoring the Study's research agenda:

- Traditional Knowledge Steering Committee
- Project Steering Committee



Native elders play a crucial role in the gathering of Traditional Knowledge about the West Kitikmeot / Slave Region.

## Traditional Knowledge Steering Committee

The Traditional Knowledge Steering Committee is made up of representatives of the aboriginal Partners on the Board. It provides guidance on traditional knowledge to the Board. It also reviews proposals for traditional knowledge research both in terms of how they meet the Study's research priorities and the quality of the research, and reviews other proposals which may have an aspect of traditional knowledge.

## Project Steering Committee

The Project Steering Committee is made up of representatives from all the Partners and reviews Scientific Knowledge projects both in terms of how they meet the Study's research priorities and the quality of the research. Each Committee makes recommendations to the Board, which considers the recommendations and decides whether or not to approve project proposals.

## Study Office

The Management Board has also set up a streamlined Study Office to operate the Study on a day-to-day basis. The Study Director, John McCullum, reports directly to the Board, working closely with the Chair between Board meetings. The Office is responsible to administer projects, communicate results, administer the Study and support the Board and Committees in their deliberations. The Partners have agreed that the Study Office must remain small and focused to ensure the maximum possible amount of resources is focused on doing research. The Study employs three staff.

# Highlights:

The Study's strong momentum from the first year continued through the second with the results of the first year's research becoming available. The results drew a high level of interest from the public and the media, as well as the Partners. The Study established a website and used the Internet as the main means of distribution for research results and other information about the Study. A number of new proposals were submitted and reviewed and funding was contributed to cover all the approved research. The Board developed solutions to several difficult technical issues related to data and funding.

## Meetings

In contrast to high numbers of meetings during the initial year, the Management Board and its two main committees, the Traditional Knowledge Steering Committee and Project Steering Committee, held six meetings in 1997-98; three in June in Wha Ti and three in January in Yellowknife. The Executive Committee met three times between Board meetings to deal with administrative issues; largely matters delegated by the Board. The Finance Committee and the Personnel Committee each met once.

The Board also directed that a Caribou Research Task Force be formed to discuss and make recommendations for research on the Bathurst caribou calving grounds and other areas of caribou research supported by the Study. The Task Force met March 12 and developed a series of recommendations.

### Research Framework

The Society's Management Board approved its Research Strategy, including a broad set of research priorities, in May 1996. This document was intended to ensure that the sum total of all the Study's research projects will provide a holistic picture of the Study area at the conclusion of the Study. It served as the basis for reviewing an initial suite of research proposals. At the same time the Board determined there was a need to further refine the Research Strategy and framework. A Terms of Reference was developed beginning in July, and a contract was let in September to comprehensively review techniques for defining research priorities in the context of the Study and existing research priorities. It was agreed that the Valued Ecosystem Component / Valued Socioeconomic Component approach would most closely meet the needs of the Study. The Partners were consulted regarding their priorities and a process was developed to refine and focus the existing research priorities into a research framework. Representatives of the Partners attended two workshops where they developed a set of research questions and attached priorities to them. These research questions were then ratified by the Board. The Research Framework has been finalized, although the Board has agreed that it will be a "living document" meaning that it will be reviewed and revised from time to time. These changes have been incorporated into the Research Strategy document.

## Annual General Meeting and Annual Report

The second Annual General Meeting took place June 26, 1997. At that time Larry Aknavigak, Chair of the Nunavut Impact Review Board, was re-elected as the independent Chair of the Management Board.

## Research Reports

All the studies provided deliverables early in the year along with an annual or final report on the project. Ten of these reports included research results (a detailed summary of projects and results begins on page 13 of this report). These results were reviewed by the Study Office, then sent to independent experts for evaluation. After review and approval by the independent experts, the Board considered the results along with comments and recommendations. Once the reports were signed off by the Chair they were released publicly and made available by Internet and through the Study Office.

## Proposals

Two calls for research proposals were issued in 1997-98; in April and in October. The Society's Management Board received 14 new proposals/revisions. These proposals were reviewed by the Study Office, then circulated to independent experts and to the Board/Committees. The Board reviewed all comments and recommendations and approved seven of the proposals. Two other proposals have been approved in principle but must be reviewed by the Executive Committee. Six of the new projects will take place over more than one year - along with four existing projects approved to continue in 1998-99.

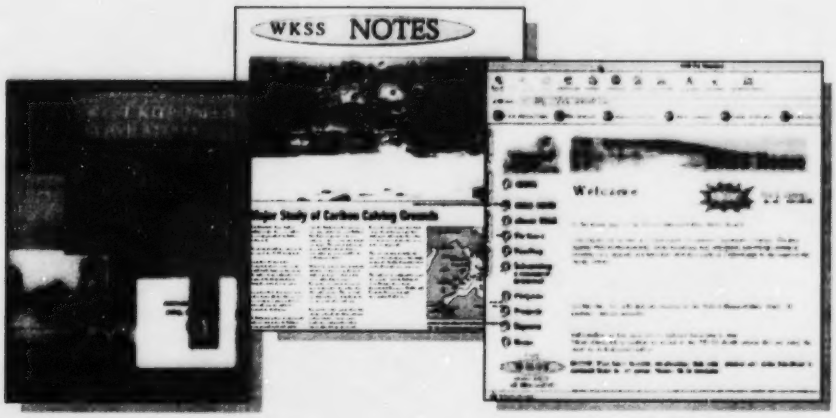
A detailed summary of projects and results begins on page 13 of this report.

## Funding

The Study raised and used about 80% of its potential annual budget of $2.25 million, with about $600 thousand contributed by the industry/aboriginal/environmental partnership and $600 thousand each by the federal and territorial governments.

The Society took a more active role in fundraising in 1997-98, and this was reflected in a significant increase in the number of organizations contributing to the Society's research. In 1996-97 eight organizations outside government made contributions, while in 1997-98 this more than tripled to 26, with increases from both the private sector and aboriginal organizations. The Society solicited funds from more than 60 companies and sent a small fundraising delegation to visit 20 mining companies in Calgary and Vancouver in November 1997.

Of the funds contributed by the industry/aboriginal/environmental partnership just over 85% was contributed by the mining industry. In particular Diavik Diamond Mines contributed just over $237,000; BHP Diamonds contributed just over $108,000; Lytton Minerals contributed $65,000 and Nunavut Tunngavik Inc. contributed $50,000. For a complete breakdown of contributions from all sectors see the revenue component of the financial statement in Appendix B.




## Communications

Implementation of the communications strategy continued throughout the year. An Internet website was set up in July 1997 [www.wkss.nt.ca] with a wide variety of information available, including all the Study's research reports. The site had 738 visits by March 31, 1998; from 7 countries including Canada. The first newsletter, called WKSS Notes, was published in May 1997, with the second coming out in January 1998. The Society plans to publish 2 newsletters each year, continuing the practice of inserting them into News/North, the Territorial newspaper. The 1996-97 Annual Report came out in January 1998 and was circulated widely. An extensive contacts database has been set up to ensure a broad distribution of Study documents.

A number of news releases were issued which resulted in media coverage primarily by News/North, CJCD radio and CBC Television and Radio. Additional stories appeared in Mining North and Up Here magazine. We plan to continue issuing news releases of research results and other information.

In addition to the communications approaches directed at a wide audience, we have tried to reach out by more direct means. A public meeting was held last year in Wha Ti introducing people there to the Study and inviting their participation in research. A public display was set up at the Geoscience Forum in Yellowknife in November 1997 and the Study Director made a presentation to the delegates. The display was also used at a Mining Week exhibit in June 1997. The Study Director made a presentation to the North Slave Metis Alliance Annual Assembly at Old Fort Rae in August 1997.

The Chair and Study Director met with the Honourable Stephen Kakfwi, Minister responsible for Resources, Wildlife and Economic Development with the Government of the Northwest Territories to brief him on progress of the Study and discuss future directions.

## Personnel

The Society employs three staff. John McCullum is the Study Director, Peter Cullen replaced Pearl Benyk as Study Assistant and James Marlowe worked for the first part of the year as the second Study Assistant.

## The Study in the "Big Picture"

Diavik Diamond Mines Project Submission

The value of the Society's research to those organizations with an interest in achieving sustainable development in the West Kitikmeot / Slave area is clearly demonstrated by the amount being used in assessing cumulative environmental and socioeconomic effects related to the Diavik project. This information has not only been useful to industry but to regulators and all those taking an interest in the potential effects of such development.

Cycles in the Mineral Industry

The recent decreases in worldwide prices of gold and other metals has affected a number of the Society's current and potential contributors. In addition the fall-out from the Bre-X issue has dampened investor enthusiasm in the mineral sector. Both of these factors have made it more difficult for the Society to raise funds from the mineral industry, and demonstrate the need for us to continue expanding the base of funders and the range of sectors involved in the Study.

Effects of Division of the Northwest Territories

The Society received a written assurance from Minister Stephen Kakfwi that the Government of the Northwest Territories remains committed to supporting the work of the Society and that such commitments are being taken into account in the process leading up to division.

Cooperation with Nunavut Institutions

A number of Nunavut Institutions of Public Government were contacted by the Society regarding ways in which the work of these institutions could be supported by the Society's research. The Partnership is confident that we can play a positive role in relation to research in the West Kitikmeot and will continue to develop and expand our relationships with Nunavut Institutions.

Relationship with Independent Environmental Monitoring Agency (IEMA) for BHP

The Chair has approached the IEMA with the intent of exploring ways in which WKSS information can be of use to the Agency. The Study Director made a presentation to the Agency regarding the Study's research.

## Contracts

The State of Knowledge report for the West Kitikmeot / Slave area was submitted in second draft and underwent wide review. We expect to wrap this contract up early in the next fiscal year and prepare to publish the document.

# Research Projects

Currently the Study has approved 20 projects under the Study's research program, as follows:

**June 1997**

- Habitat/Vegetation Classification for the West Kitikmeot/Slave Study Region
- Tuktu and Nogak
- Investigation of Aquatic Impacts of On-Ice Exploratory Diamond Drilling (part 2)
- Reading Water Quality Record in West Kitikmeot/Slave Sediment (part 2) (completed)

**March 1997**

- The Habitat of Dogrib Traditional Territory: Place names as Indicators of Bio-geographical Knowledge

**November 1996**

- Investigation of Aquatic Impacts of On-Ice Exploratory Diamond Drilling (part 1) (completed)
- Traditional Knowledge Study on Community Health: Community Based Monitoring

**May 1996**

- Seasonal Movements of the Bathurst Caribou Herd
- Summer Behaviour of the Bathurst Caribou at Mine Sites (completed)
- Dogrib Traditional Knowledge: Relationship between Caribou Migration Patterns and the State of Caribou Habitat
- A Community Based Monitoring System in the Slave Geological Province Case Study - Lutselk'e (completed)
- Wolverine Ecology, Distribution and Productivity in the Slave Geological Province
- Reading Water Quality Record in West Kitikmeot/Slave Sediment (part 1) (completed)
- Population Ecology of Grizzly Bears in the Slave Geological Province
- Caribou Calving Ground Project: Habitat Characteristics of the Calving Area of the Bathurst Caribou Herd
- Esker Habitat Studies in the Slave Geological Province
- Airborne Dust Level Baseline Monitoring Project (completed)
- Lutselk'e Traditional Knowledge of West Kitikmeot/Slave Study Area: Overview, Assessment and Research Planning (completed)
- Preliminary Proposal to Develop Three Comprehensive Proposals to Undertake Traditional Knowledge Research Associated with Three Scientific Research Studies (completed)
- Preliminary Traditional Knowledge Study and Formation of Steering Committee - Yellowknife Metis Council (completed)

Final or Annual reports are available through the Study office. Annual report results should be considered preliminary and may not be quoted or cited without written permission of the Society.

Photo: Natasha Thorpe

*Elders and youth from across the Kitikmeot region gathered on the land at the Hiukitak River to remember and share stories about the Bathurst caribou herd. The elders' stories contain important information about caribou behavior in the past.*

## Tuktu and Nogak Project

Organization / Researcher: Simon Fraser University and the Tuktu and Nogak Board, Natasha Thorpe
Length of Project: 2 years
Total Project Budget: $135,040

This project will record local knowledge from Inuit elders, primarily from Umingmaktok (Baychimo) and Kingaok (Bathurst Inlet), on caribou and calving areas in the Bathurst Inlet area. It builds on the Naonayaotit Study, which used questionnaires to collect information from community members. The research will be directed by an elders advisory committee to ensure the project is community driven (known as emic methodology). Senior research partners and youth assistants from the communities will be hired and trained to review other studies done in the area, to develop guiding questions and to coordinate the project within the communities. Elders and researchers will visit places on the land used by elders to promote discussion and encourage sharing of information. Community researchers will record the information on audio and video tape; later they will translate and document the knowledge and enter it into a Geographic Information System (GIS). The project will provide both community members and scientists with information about wildlife in the Bathurst Inlet region with a focus on how and why the Bathurst caribou herd uses the calving grounds. This study will exchange information with scientific studies on caribou and possibly those on grizzly bears, wolves and wolverine.

Update: The first year of this project concentrated on setting up an appropriate research structure and relationship with Inuit elders with a knowledge of wildlife in the Bathurst Inlet area. This included development of a Board, development of partnerships with Inuit and Nunavut agencies, agreements on control and communication of data and research results, preliminary interviews including translation and transcription, development of a research plan and set of guiding questions and ongoing communication with the many partners including posters, a website and a logo contest. The main focus for 1998-99 will be an elder/youth field camp involving a major expedition on the land and intensive interviewing and videotaping of elders in early August.

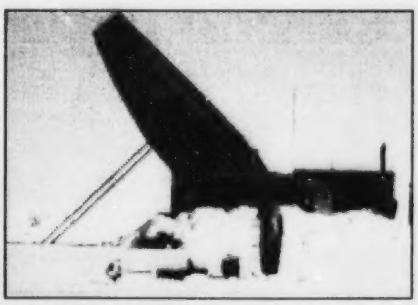


Photo: Sid Brulsema.

*A Diavik Diamond Mines drill rig (background) on Lac de Gras. In the foreground, Bart Blais stands beside one of the holes drilled to allow water samples to be taken. The auger used to drill the sample holes is seen lying on the ice surface.*

## Investigation of Aquatic Impacts of On-Ice Exploratory Diamond Drilling (3rd year)

Organization / Researcher: Anne Wilson
Length of Project: 3 years – Approved for final year.
Total 3-year Project Budget: $18,400

This project will look at the effects of diamond drilling - through the ice - on water clarity and organisms living on lake bottoms. The project will measure water cloudiness caused when the lake bottom sediment is disturbed and diamond drills release rock particles into the water. The distance these particles travel before settling and

the thickness of material deposited is determined by collecting sediment samples in clear Plexiglas tubes from the lake bottom at various distances from the drill. Sediment samples are analyzed chemically to determine changes in sediment chemistry and particle size. Lake bottom organisms are examined to see if there are any differences in the species and numbers of organisms before and after drilling takes place. This information is needed by both industry and regulating agencies responsible for granting mineral exploration permits or water licenses. These agencies try to protect the environment without placing unnecessary restrictions on mining exploration companies, which must follow environmental legislation.

Update: Sampling took place at Baton Lake and Great Slave Lake during February and March, 1997, and again in the summer of 1997. Both of these drilling sites were through non-kimberlite rock. Sampling took place at Lac de Gras in winter 1998 (kimberlite rock drilling). Sediment samples and samples of water captured before and after drilling were taken for analysis. Samples of the lake bottom were also taken to look at organisms living there and the effects of drilling on them. The same measurements were done at sites in the lake where no drilling took place. Initial results from Great Slave Lake and Baton Lake seem to show that the drilling has very little effect on water quality; sediments settle out very quickly and little is deposited on the lake bottom 15 metres away from the drill hole. The sediment from drilling does not seem to add toxic material to the lake. There were no significant effects on bottom-dwelling organisms seen at the Great Slave Lake sites. Baton Lake and Great Slave Lake were studied over the summer of 1997 to see if the drilled material from the previous winter re-suspended when the lake surface was ice-free. Researchers did not see any re-suspension at Baton Lake. In preliminary experiments in which sediment was used to cover bottom dwelling insects - as would happen during drilling - researchers did not find any direct toxicity to the insects. Further studies will reveal if drill sediments affect the complete life-cycle of these creatures. Results from kimberlite drilling and final results from Baton Lake drilling are expected this year.

Photo: Glen Stephens

*A sediment core is drawn from the lake bottom in order to determine changes in the lake over a number of decades.*

## Reading Water Quality Record in West Kitikmeot/Slave Sediment

Organization / Researcher: DIAND, Brian Latham/Glen Stephens
Length of Project: 5 years
Approved for one year only (with costs split over two years).
Total Project Cost: $21,946

The land is constantly being worn away and this material, as well as that dropping from the air, is carried to lakes where it settles on the bottom as sediment. In this project, sediment from two lakes north of Lac de Gras will be examined to provide an understanding of what has been happening nearby over the last several hundred years. This will show what the environment was like both before and after mining development took place. Researchers will lower a sampling device containing a hollow tube into the lake bottom of Lac du Sauvage and Slipper Lake and bring up samples of sediment up to two metres long. Information on the past and present quality of the water, the pollution in the air and water and the types and health of plants near the lake will all be obtained by studying the samples.

**Update:** Funding for this project is now complete. The first sediment samples were collected from Slipper Lake and Lac du Sauvage in March 1997. Slipper Lake is likely to be affected by development of a mine by BHP while Lac du Sauvage is nearby but should be unaffected. 1997/98 funding was approved to complete the analysis of sediment cores since the cores were not taken until March of 1997. Analysis of algae in the sediment cores from Slipper Lake show a continuing pristine, clean water lake with increased acidity beginning around the year 1820, as well as indications of less ice cover (seasonally open water conditions), and/or more turbulent mixing of the water from the early 1800s to the present. Algae changes throughout the sediment core may also be related to climatic warming. Analysis of metal in the cores showed no significant changes over time. The sediment cores taken from Lac du Sauvage were not usable.

Photo: Courtesy of GNWT

*Specialist Dave Taylor performing habitat image analysis at the NWT Center for Remote Sensing.*

## Habitat / Vegetation Classification for the West Kitikmeot / Slave Study Region.

Organization / Researcher: Northwest Territories Centre for Remote Sensing, Helmut Epp
Length of Project: 4 years
Total Project Budget: $476,700

Information from satellites will be put into a computer and used to make vegetation maps of the region. The project will work in cooperation with a traditional knowledge project by the Dogrib Treaty 11 Council to produce a joint habitat classification in the Lac de Gras area. Similar work will be done in an area north of Lac de Gras, followed by analysis on the Bathurst Caribou Calving Grounds. This information will be useful for all researchers doing wildlife studies in the West Kitikmeot / Slave area, as well as for identifying important vegetation / habitat areas and assessing effects of development.

Update: A vegetation classification of the Lac de Gras area has been produced with 14 different classifications ranging from Sedge Wetland to Spruce Forest. Summer field work was done to provide the researchers with on-the-ground vegetation information to support the satellite data. Ground information gathered by Diavik Diamond Mines was used for the same purpose. Work on images of the Bathurst caribou calving grounds has begun.

Photo: Bobby Gon

*Elders Noel Crookedhand, Jimmy Martin and Robert Mackenzie shown on a research trip in March of 1998.*

## The Habitat of Dogrib Traditional Territory: Place names as Indicators of Bio-geographical Knowledge

Organization / Researcher: Dogrib Treaty 11 Council
Length of Project: 4 years
Total Project Budget: $1,013,640

Place name information from previous Dogrib traditional knowledge projects will be reviewed, confirmed by elders and put into a Geographic Information System (GIS). This study will have a similar structure and use a similar research methodology as the Dogrib Traditional Knowledge of Caribou study (see page XX). Traditional knowledge on habitat around Lac de Gras, including the stories connected to traditional place names, will be collected. Maps will be produced and this traditional knowledge information will be combined with satellite imagery maps from the NWT Centre for Remote Sensing study (see above) with the goal of producing a joint habitat classification.

Update: The first part of the year was spent finding place name data from previous interviews, assembling it and putting it into a database and GIS. A total of 2177 entries were made. Researchers are working closely with elders who used the area in the past. The researchers look for linguistic patterns associated with particular habitat types so each place name must be translated; 630 so far. Of these 89 have been analyzed for literal and conceptual meaning. A series of maps have been produced showing the location of the place names in various categories. The place names provide information about the land, waterways or resources found at each site which helped people carrying out the main task of caribou hunting. The project includes an ongoing training component.

Photo: Marie Catholique.

*Community Researcher Evelyn Marlowe transcribing elders' stories gathered during the Traditional Knowledge Study on Community Health.*

## Traditional Knowledge Study on Community Health: Community Based Monitoring (Revised January 1998)

Organization / Researcher: Lutselk'e Dene First Nation, Brenda Parlee (Part I) Evelyn Marlowe (Part II)
Part I (Traditional Knowledge Study of Community Health):
Length of Project: 7 months
Total Project Budget: $54,350

Part II: (Community Based Monitoring):
Length of Project: 3.5 years starting: July, 1997
Total Project Budget: $285,120

This two-part project will build on a previous WKSS project which gathered information from community members to develop a set of indicators to measure changes in community health. Two local researchers will be trained and then gather traditional knowledge from Dene elders about community health in the past. The researchers will use the indicators and traditional knowledge gathered in Part I to track changes in community health resulting from development. Information will be checked for accuracy at workshops and communicated to residents of the community. For information on the previous project, access the WKSS website or contact the Study Office.

Update: Part I: A researcher trainee was hired and has been trained on-the-job in research methods and advanced Chipewyan language skills. She has also acquired background on community health issues. An Elders Advisory Committee was set up and is working with the researchers. Questions were developed for interviewing elders regarding traditional knowledge of past community health using the results of the Community Based Monitoring study; the interviews are now completed. Many stories related to the indicators were collected. A brief summary of the analysis shows that meaningful work, learning to live the Dene way of life, harvesting and eating traditional foods, and issues related to changes in illness and health care were considered very important in a traditional view of community health.

**Part II:** The first four-month monitoring cycle began in August 1997. The trainee from the Traditional Knowledge project moved into the position of Project Director. The Advisory Committee selected four indicators to monitor: jobs and related issues/effects; nutrition, especially country food; employment goals of children and effectiveness of treatment programs for community members. A report was submitted in November, with the second cycle expected to finish in February/March with a report to follow. The Study Board approved an application by the project to allow for two full-time researchers.

Photo: NWT Archives

*The Bathurst Caribou herd is approximately 350,000 strong. By November 1998, 20 caribou cows will be tracked by satellite collars in order to map the seasonal movements of the animals.*

## Seasonal Movements of the Bathurst Caribou Herd (Revised January 1998)

Organization / Researcher: GNWT, Anne Gunn
Length of Project: 5 years
Total Project Budget: $611,500

This project will gather information about caribou movements by collaring caribou with satellite transmitters so they can be tracked throughout the year. It will also help in finding where most of the Bathurst herd have their young. The scientists will look at the number of uncollared caribou near each collared animal, so they have an idea of how many caribou are represented by the movements of the collared animals. Other information about the calving grounds, such as snow depth and rates of spring snow melt, and temperatures and amount of wind, which affect insect activity, will also be recorded. This information will help scientists to figure out the reasons for changes in seasonal movements of the herd from year to year, including movements within the calving ground. This project will exchange information with traditional knowledge studies on caribou with both the Inuit around Bathurst Inlet and the Dogrib.

**Update:** By the beginning of the project's second year seven caribou cows were still being regularly monitored. The collars on those animals were planned to be removed in 1998, however the WKSS Board approved additional funding in January and the number of collars was brought back to ten. After receiving support from aboriginal partners, WKSS increased funding so that the total number of collared cows will be brought to 20 in November 1998. Caribou movements are tracked daily by satellite during calving and post-calving, and weekly after that. Maps have been produced showing the movement of each caribou each month. The collared cows were all in the main calving ground in 1997 and 1998, which was west of Bathurst Inlet. The collars showed a very different movement of caribou in the winter of 1997-98 compared to 1996-97, with most of the animals going to the east end of Great Slave Lake, and some actually going as far south as the Saskatchewan border.

Cotton grass growth (a source of post-calving nutrition for caribou cows) was measured at sampling sites east of Bathurst Inlet in June of 1996 and 1997, including relation to snow melt, and timing of flowering and leafing out. Snowmelt at these sites was faster in 1996. A site west of Bathurst inlet was studied in June of 1997 and the snowmelt was found to be more advanced there than on the eastern side of the Inlet.

This project is being done in cooperation with the Dogrib Traditional Knowledge Study of Caribou to provide a more holistic knowledge base. The study will work closely with the new Calving Ground Study (above) approved this year.

## 1996-1997

Cow #62

Figure 3. Movements of collared Bathurst caribou #62 from April 1996 to April 1997

Cow #67

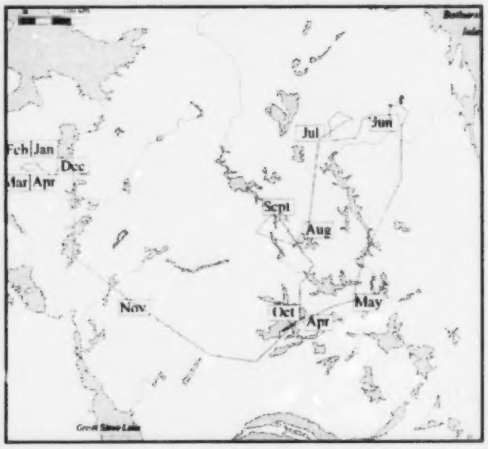



Figure 3. Movements of collared Bathurst caribou #67 from April 1996 to April 1997

## 1997-1998

Cow #62

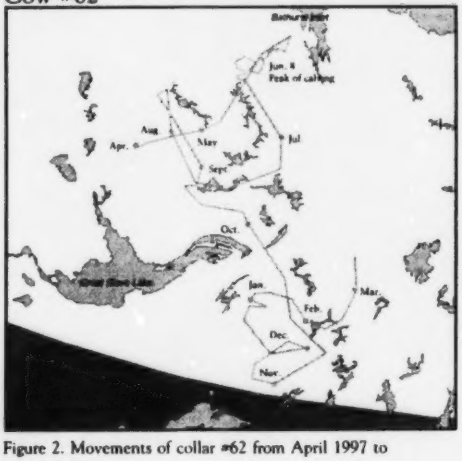



Figure 2. Movements of collar #62 from April 1997 to March 1998.

Cow #67

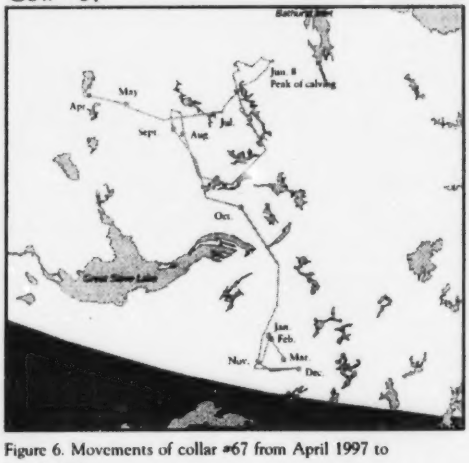



Figure 6. Movements of collar #67 from April 1997 to March 1998.

Satellite tracking showed a very different movement of caribou in the winter of 1997-98, compared to 1996-97, with most of the caribou going east and south of Great Slave Lake.

Photo: Government of the Northwest Territories, RWED.

*A view of the wood and rope fence with plastic flutters (based on a traditional Dogriddesign). The fence was successful in redirecting the movements of caribou. Actual height of the fence is approximately three feet.*

## Summer Behaviour of the Bathurst Caribou at Mine Sites

Organization / Researcher: GNWT, Anne Gunn
Length of Project: 3 years
Total Project Budget: $64,000

Update: This project is now complete. Significant exploration and mining developments are taking place around the Bathurst caribou herd's calving grounds and migration routes. Caribou seem to be attracted to mining infrastructure such as tailings ponds, airstrips and roads. In this project, researchers and remote cameras observed caribou behaviour around mine sites and tested two methods of diverting caribou from mine sites and other developments. Researchers studied caribou near Lupin mine in late June and early July of 1997 and found that a wood and rope fence with plastic flutters - based on a traditional Dogrib design - was successful in restricting the movements of caribou (none crossed the wood and rope fence once it was completed). The second method involved laying a sheet of plastic on the ground and was less successful (almost half of the caribou crossed the plastic). Native elders were involved in observing and commenting on the caribou behavior. Researchers also measured temperature, wind and fly activity, and documented other caribou behavior around the mine site. It was found caribou were resting on tailings areas and feeding nearby even when mosquitoes were not present, possibly because there is no cover to conceal predators. Researchers collected plants and measured dust levels near the roads and tailings ponds to see whether the dust affects the types of plants growing in an area - the only effects were seen in areas close to, and downwind from, tailings ponds.

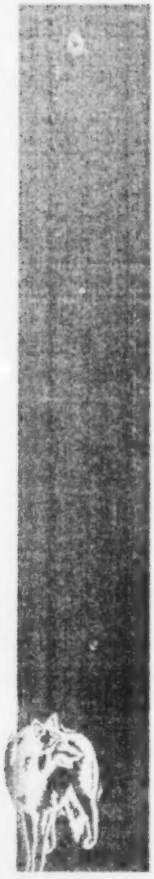
Photo: Melissa Mantla.

*Johnny Eyakfwo and Jimmy Martin, both K'aowo (leaders) for the elders advisory committee. Mr. Eyakfwo passed away during this year of the project. He was dedicated to the sharing of Dogrib values, beliefs and knowledge with all young people, both Dogrib and non-Dogrib.*

## Dogrib Traditional Knowledge: Relationship between Caribou Migration Patterns and the State of Caribou Habitat

Organization / Researcher: Dogrib Treaty 11 Council
Length of Project: 4 years
Total Project Budget: $706,700

This project will record traditional knowledge from Dogrib elders about caribou movements, caribou habitat and the relationship between the Dogrib and the caribou. It will be directed by an elders advisory committee. Community researchers will learn the stories from their elders and document the knowledge contained in the stories. First researchers will work with elders, a Dogrib language specialist and the principal researcher to record formal Dogrib terms about caribou, including caribou distribution and habitat. Researchers will go through all existing materials on traditional knowledge about caribou. The project will provide both aboriginal people and scientists with the basic information on caribou movements and habitat okay as is required to make meaningful decisions necessary for industry and caribou to co-exist. This project will exchange information with the scientific study on caribou movements.



**Update:** Information on locations of caribou water crossings and traditional caribou fences have been mapped and put into a computer. Most of the information gathered is about general caribou migration patterns, caribou behaviour and the relationship between caribou migration patterns and humans. Ninety-eight place names related to caribou have been documented and mapped. Researchers have interviewed 25 elders for a total of 43 interviews or 74 hours of taped information about caribou migration and caribou habitat. Researchers have been asking more specific questions about how caribou break trail, insect avoidance, why and how caribou choose their travel routes, and the importance of smell to the caribou. Elders have said that caribou don't go where there have been fires because they cannot smell their food, but instead smell burnt vegetation. Some elders think that caribou might veer away from development areas due to the smell of oil and gas which may overpower the smell of the food source that helps guide the animals.

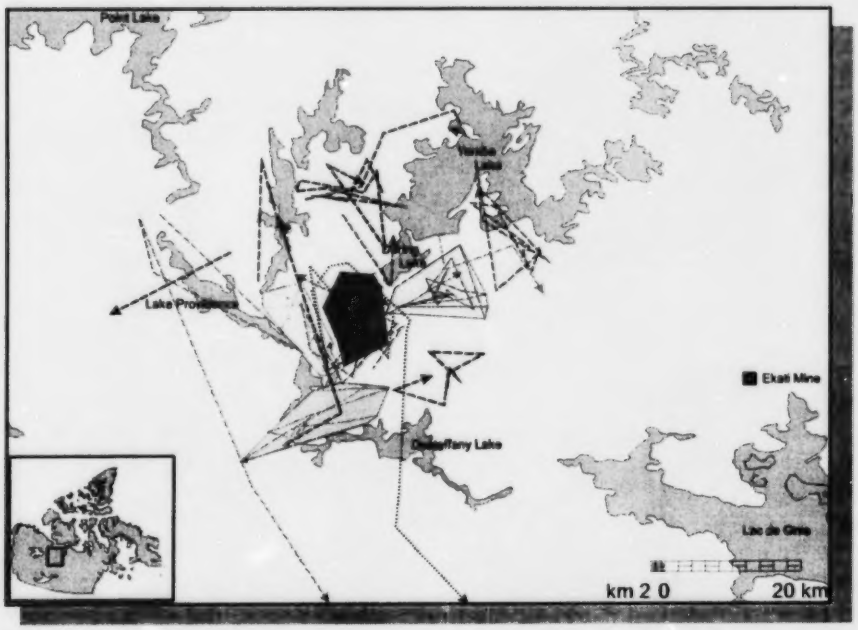
Photo: Robert Mulders

*Charlie Wetrade holding a wolverine during the capturing and collaring effort at Daring Lake.*

## Wolverine Ecology, Distribution and Productivity in the Slave Geological Province

Organization / Researcher: GNWT, Robert Mulders
Length of Project: 4 years
Total Project Budget: $289,000

Wolverines live and breed in large areas of undisturbed land. Developments like roads and mine sites could pose a danger to wolverine populations by making overhunting possible and reducing the amount of suitable wolverine habitat available. In this project, up to 40 wolverines will be captured and collared with radio transmitters. This will allow researchers to track their movements, see where they den and determine if they use the same areas for denning every year. Information on the movement of young wolverines (in areas where they are not being hunted) naturally




Movements of 18 radio-collared wolverine between January and December 1997. The shaded areas enclosing dotted lines represent areas used by wolverines for which there are several months of data. Broken lines represent wolverines for which there is currently insufficient data to create a polygon. Two adult female wolverines left the study area to the southeast (arrows at bottom of map) in October 1997, but subsequently returned in 1998.

move to other areas where there are fewer wolverines. Wolverine carcasses and information will be collected from hunters in the mainland Kitikmeot communities. Analysis of the carcasses will allow researchers to learn about the age and sex of captured animals and the timing of the wolverine harvest in that area.

Update: Twenty-six wolverines have been captured since the start of this project. Most recently 7 were captured in November 1997 (3 female, 4 male) and 8 in March 1997. Each collar is located every two to four weeks. Maps were produced of their movements. Each animal seems to have a defined home range with young wolverines moving around a lot more than adult wolverines. Home range sizes vary from 59 to 1905 square kilometres, although some of these are young wolverines which move over much larger areas. Preliminary conclusions show somewhat smaller home ranges than researchers expected from information in other studies; and that as adolescent wolverines begin to mature they leave their natal range and travel further afield. The harvest study showed 137 wolverines (two thirds male) were taken during 1996/97. The carcasses are studied to determine age, sex and productivity of harvested animals.

Two animals died as a result of infections probably caused by collars (this type of collar is no longer used). This was discussed with the Kugluktuk Hunters and Trappers Association which continues to support the project.

Photo: Robert Gau

*Researcher Phil McLoughlin holds a satellite collar used to track the movements of grizzly bears. The collars are removed from the bears after a study period of 12 to 18 months.*

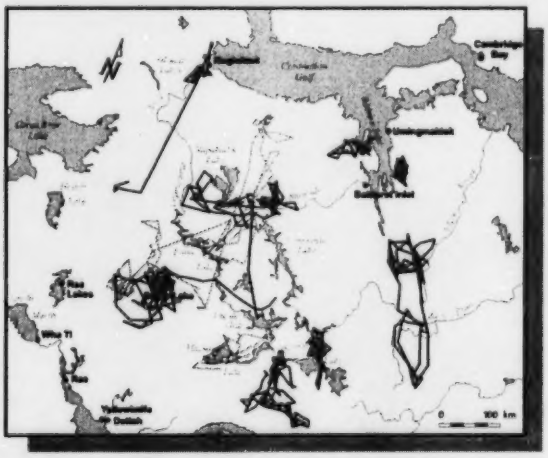
## Population Ecology of Grizzly Bears in the Slave Geological Province

(Revised January 1998)

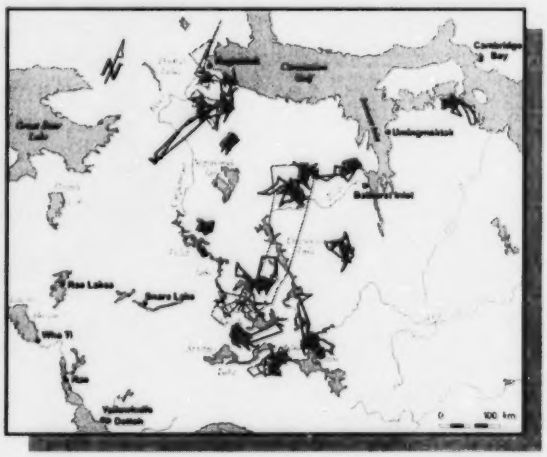
Organization / Researcher: University of Saskatchewan, Francois Messier / GNWT, Ray Case
Length of Project: 4 years
Total Project Budget: $1,079,000

Very few studies have been done on grizzly bears in the central Arctic. If we want grizzly bears to survive the environmental changes brought about by man's activities, including the development of mines, it is important to know what type of environment and how much space barren ground grizzly bears need. This study will provide the information needed to measure the effects of development on grizzlies. About 100 bears will be fitted with satellite transmitters attached to collars and their movements will be monitored by satellite for three years. Traditional and scientific knowledge will be gathered on where the grizzlies travel, live and have their dens, what food they eat, how much nutrition is in the food and what types of land they prefer. The second part of the study will estimate how many grizzlies there are in the area and suggest a safe hunting quota which will not endanger the grizzly population. The researchers will study how grizzlies behave around mines to see how mines may affect them. Biologists working for the BHP and Diavik mining companies will study bears on their mining properties, recording their behaviour, feeding and denning locations and how they react to mining activities. This project will exchange information with studies on traditional knowledge of wildlife.

**Update:** The study has now been expanded to include areas north of Contwoyto Lake, east of Tree River and east of Bathurst Inlet - in the high development potential Hope Bay belt area. Most of the 1997/98 collaring was done in this area. Sixty-five bears have now been tracked by satellite collar as part of this project. There are currently 27 bears collared (20 satellite collars and 7 radio collars). Twenty-five collars were removed last year. Data so far shows that young males move over very large distances while adult males and females stay in relatively defined areas. Adult males in this study moved over an area averaging 6,320 square kilometres, while females without young covered an average of 1,200 square kilometres and females with young averaged 1,470 square kilometres. Most bears have denned in October of each year, coming out again in late April or early May. Initial results show that eskers may not be as important for grizzly denning as originally thought (only one of 18 dens was found on an esker). Statistics do seem to show that males use eskers a lot in the spring, probably because eskers are the first areas to lose the snow. In summer there seems to be most use in the "heath tundra" and "tall shrub" habitats. Males move faster than females. Work is proceeding on producing grizzly bear habitat maps based on maps produced by Diavik Diamond Mines. Maps will also be used from the WKSS Habitat Classification project. A nutritional study to determine the foods eaten by grizzlies at different times of year and their physical condition is also being carried out. During the period when bears are active there are three (of five) "seasons" where their diet is largely caribou (spring, mid-summer and autumn). The diet was mostly green vegetation in early summer and berries in late summer. A partnership has been developed with the Kugluktuk Angoniatit (Hunters) Association's traditional knowledge study to share information so a more complete picture of grizzlies can be developed.



Movements of male grizzly bears 1997/98.
Annual ranges average 6,685 km².



Movements of female grizzly bears.
Annual ranges average 2,074 km².

Photo: Dean Cluff

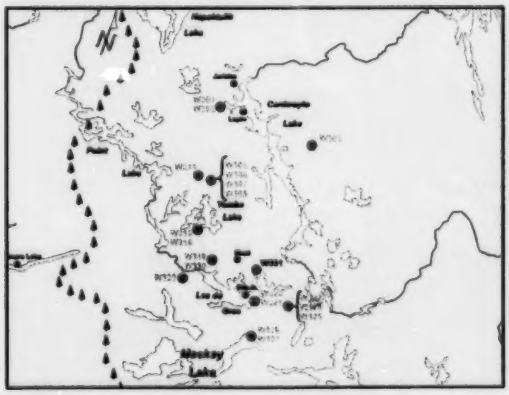
*A female wolf captured at Rocknest Bay on Aylmer Lake comes out of sedation after being collared. The collar will be removed after 12 months of study of the wolfs movements and denning patterns.*

## Esker Habitat Studies in the Slave Geological Province

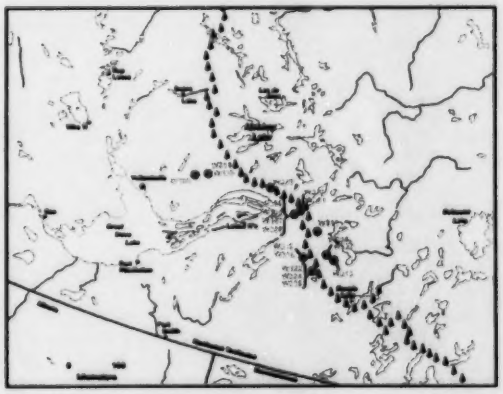
Organization / Researcher(s): GNWT, Dean Cluff; DIAND, Stephen Traynor
Length of Project: 3 years
Total Project Budget: $277,000

Eskers, the long ridges of sand and gravel left behind when the glaciers melted, are important for many reasons, including their use by wolves as places to build dens. Eskers are also valuable as a source of gravel and sand for roads, airstrips and other development infrastructure. This project, which will produce information about eskers before any development has taken place in the area, will be of value to those making decisions about how we can use the land without harming it. Eskers in the Lac de Gras / Contwoyto Lake area will be counted and recorded on maps. Notes will be made on eskers used by wolves. Four wolves with dens in the Lac de Gras area and two wolves with dens outside this area will be captured and collared with transmitters. Following them by satellite will allow researchers to see their movements during the time they are having their young. This information, taken before there is any mining in the area, will later be compared with their movements when mines are operating nearby. Information on other eskers and wolves, outside the Lac de Gras area, will be added to computer maps and new computer maps of the eskers east and northeast of Contwoyto Lake will be made. These will include the traditional use of these eskers by aboriginal people and by wolves for denning.

**Update:** Approximately 250 eskers in the Lac de Gras, Contwoyto Lake and Nose Lake area have been located. Up to 10 of these were not shown on existing maps of the area. The eskers are being entered into a Geographic Information System (GIS) in cooperation with the Nunavut Planning Commission. Data including percentage covered by vegetation, shape and drainage was collected about 132 eskers. Samples from 20 eskers were analyzed and found to contain predominantly sand covered by stone and pebbles; very little silt or clay was found. Maps have been produced which will be taken to communities for final approval before they are published. This information is available on a database and in CD-ROM format. An additional thirty-six active wolf dens (some not previously known) were mapped and entered into a digital database. Using satellite collars, researchers were able to accurately track the movements of wolves in eight different packs. In the winter of 1997/98, the wolves traveled straight line distances of 470 to 600 km following the Bathurst caribou as they moved south to the area just north of the Saskatchewan border.



Wolf locations north of Great Slave Lake in September 1997.



Wolf Locations in November 1997 as the animals followed the Bathurst caribou herd south.

# Past Projects

### Caribou Calving Ground Project: Habitat Characteristics of the Calving Area of the Bathurst Caribou Herd

Organization / Researcher: Fritz Mueller
Length of Project: 3.5 years
Total Project Budget: $673,000
Project terminated. Project re-organized and revised for April 1998.

### A Community Based Monitoring System in the Slave Geological Province Case Study - Lutselk'e

Organization / Researcher: Lutselk'e Dene First Nation / Brenda Parlee
Length of Project: 1 year
Total Project Budget: $54,350

### Airborne Dust Level Baseline Monitoring Project

Organization / Researcher: GNWT, Emery Paquin
Length of Project: Approved for one year.
Total Project Budget: $53,000

### Lutselk'e Traditional Knowledge of West Kitikmeot/Slave Study Area: Overview, Assessment and Research Planning

Organization / Researcher: Lutselk'e Dene First Nation, Ellen Bielawski
Length of Project: 4 months
Total Project Budget: $41,700

### Preliminary Proposal to Develop Three Comprehensive Proposals to Undertake Traditional Knowledge Research Associated with Three Scientific Research Studies

Organization / Researcher: Rae Edzo Metis Nation Local # 64
Length of Project: 3 weeks
Total Project Budget: $10,000

### Preliminary Traditional Knowledge Study and Formation of Steering Committee

Organization / Researcher: Yellowknife Metis Council
Length of Project: 10 weeks
Total Project Budget: $14,000

# WKSS Research Questions

(approved February 11, 1997)

## SOCIO-ECONOMIC RESEARCH

### A. *Traditional Economy:*

**1. What is the baseline information about the nature of the traditional economy for the region, specifically:**

a) What are the existing patterns for each community of:
   i) natural resource use?
   ii) harvesting patterns, particularly for caribou?

b) What is the value of the traditional economy:
   i) in dollars?
   ii) in subsistence value (local consumption, cultural well-being)?

### B. *Social and Economic Benefits / Dis-benefits*

**2. What are the social and economic benefits and dis-benefits of development to communities?**

a) Social Benefits / Dis-benefits:
   i) Which indicators are most appropriate for monitoring changes in social wellness?
   ii) What is the baseline information concerning social wellness for each community, using community based indicators? What is the baseline information concerning family related issues (e.g., violence), substance abuse, services and infrastructure, and economic disparity between and within communities?
   iii) What is the traditional knowledge about social wellness?
   iv) What are the socio-economic and human health trends and effects of development, using community based and environmental indicators?

b) Economic Benefits / Dis-benefits:
   i) What is the baseline information on economic conditions for each community, using community based indicators?
   ii) What is the indigenous knowledge about community economic conditions?
   iii) What is the indigenous knowledge about the socio-economic and human health effects of non-traditional economic development?

## PHYSICAL AND ENVIRONMENTAL RESEARCH

### C. *Water Quality:*

**3. What is the baseline water quality for the region, specifically:**

a) What are the key parameters for water quality from a perspective of:
   i) socio-economic / human health?
   ii) ecological health?

b) What are the baseline conditions with respect to these parameters?

c) Where should these parameters be measured?

d) What is the distribution, cause and magnitude of poor water quality with respect to key parameters?

e) Where should poor water quality be measured?

f) What is the traditional knowledge about water quality?

g) What are the effects of contamination on the cultural, spiritual, and emotional health of people?

### *D. Surface Drainage:*

**4. What are the regional patterns and variations in surface water flow?**

a) from a scientific perspective?
b) from a traditional knowledge perspective?

### *E. Baseline Habitat and Land Use:*

**5. What is the baseline information about habitat for the region, specifically:**

a) what is the distribution of:
   i) soil types?
   ii) terrain types, especially eskers?
   iii) vegetation communities?
b) how are these habitats used by humans as well as grizzly bear, caribou, wolves, and moose?
   i) How does this use vary seasonally?
   ii) For these species, what are the:
   - most significant habitats?
   - critical areas?
   - migration routes?

**6. What is the land use and distribution of human facilities in the region, such as:**

- cultural, heritage and sacred sites
- camps
- cabins
- trails
- communities
- seasonal roads
- mines
- other infrastructure?

### *F. Habitat Loss / Fragmentation / Alienation:*

**7. What is the state of knowledge about the effects of human activities and facilities on ecosystems and key species:**

a) species likely to be affected, particularly grizzly bear, caribou, wolves, moose, and endangered or threatened species, in a way that is detrimental to the ecosystem and / or human well-being?
b) extent of habitat loss or alienation for grizzly bear, caribou, moose, wolves, and endangered or threatened species?
c) known responses and behaviour of grizzly bear, caribou, moose, wolves and endangered or threatened species to human activities/facilities?

**8. What mitigation methods are effective in minimizing the effects of human facilities on the movements and behaviour of wildlife, particularly caribou?**

**9. What is the indigenous knowledge about mitigation methods which are effective in minimizing the effects of human facilities on the movements and behaviour of wildlife, particularly caribou?**

### *G. Wildlife Mortality:*

**10. What is the magnitude and distribution of mortality to caribou, grizzly bear and waterfowl from human causes, including recreational and subsistence hunting, vehicle-wildlife collision and killing of "nuisance" animals?**

# Overview of Results

With completion of its second year the Study is in full swing. Several studies are now complete and a number of others are entering their final year. Research results, and feedback about the research reports from independent expert reviewers, continues to be positive. Answers to some specific questions can already be seen. The "big picture" which the studies are intended to show, can be seen on the horizon, with each study's place in the mosaic becoming clearer. Much more will emerge as individual projects wind up and provide final reports.

Several organizations, including WKSS Partners, have informed us that the results have been directly useful in their decision-making processes. This is the surest indication that the Study is achieving its goal of providing necessary information for informed decision-making in the Study area.

A key feature of our research is the holistic approach to the Study: the emphasis on the value of both scientific and traditional knowledge, the research framework and priority questions which direct the selection of projects, the relationship between researchers and the communities and of course, the partnership. This holistic view is put into practice through the encouragement of interaction between researchers, linkages between projects and through information sharing and consultation between the many experts in their fields, both scientists and elders.

Inuit hunters are involved in the capture and collection of data in the first ever study of arctic wolverines in the NWT. Capture rates for collaring the wolverines went up when local hunters on skidoos were asked to take over from helicopter-mounted researchers. Students at local schools participate in the research while learning about wildlife biology. Researchers and hunters both learn a great deal about wolverines from one another, as well as transferring skills.

The role of community understanding and traditional knowledge in relation to community health is a fundamental basis for a series of projects in the community of Lutselk'e. The community has developed indicators of community health in three areas: self-government, healing and cultural preservation. These indicators are rooted in elders' traditional knowledge about Dene life on the land, which is used as a baseline against which to monitor changes in key indicators. This research is providing new insights into ways to increase the relevance and effectiveness of community health monitoring. At the same time community members are developing research and monitoring skills and experience.

Consultation with Dene and Inuit elders has been a vital part of a completed project on the behaviour of caribou around mine sites. Subsistence harvesters' concerns about caribou getting into tailings ponds was an important factor in developing the project, and traditional knowledge about ways to redirect caribou was tested to help develop methods for diverting the herds away from mine sites or other areas of concern. The traditional caribou flutter, modified using a rope fence and flagging tape, was successful in diverting caribou.

The interaction of ideas from many disciplines and from western scientific and traditional knowledge has benefited the Study significantly. An excellent example has been the caribou research task force which the Study brought together to make recommendations to the Board on priority areas of study on the Bathurst caribou calving ground. This group included all WKSS researchers working on caribou-related research as well as representatives of the various aboriginal communities involved in the Study. Their recommendations put the strongest emphasis on food and nutrition, but also discussed predators, parasites, climate and the possible effects of human activity.

The task force recommendations provided direction to an ongoing study looking at the reasons why caribou calve where they do. This study has provided a clearer understanding of Bathurst caribou feeding habits during the calving season, as well as on the types of habitat calving caribou are found in. As more data is gathered this understanding will help all Partners to be more confident about how development which could affect Bathurst caribou can be managed.

In addition to the valuable input we receive from the broad mix of elders and researchers with various areas of expertise, the Study has focused scientific and traditional knowledge research on the same question where possible. For example, the calving grounds study above, is paralleled by the Tuktu and Nogak project which works with Inuit elders to gain a better understanding of caribou behaviour, particularly on the calving grounds.

A number of other studies on caribou also link together to broaden and deepen our understanding. These include a Dogrib traditional knowledge study on Bathurst caribou migration and behaviour, coupled with a project using satellite monitoring to track Bathurst caribou cows. The initial reports have shown that elders knowledge of key caribou crossing points matches the movements of caribou on the ground. Over the next few years the study will seek answers to a number of questions about caribou bahaviour. The two studies have been designed so that information is shared between them. Confidence in the satellite collaring project has been high, so that the Study's aboriginal Partners have now given approval to increase the number of collars and the duration of the project. At the same time the traditional knowledge work is providing some new understanding about the reasons for changes in caribou migration routes over time. Knowledge from Inuit elders will complement the information already collected. A third traditional knowledge study which has been approved in principle will involve elders from Lutselk'e in examining changes in caribou activity and other wildlife, and the underlying reasons for such change.

These studies also have links to other WKSS research projects. Caribou migration patterns have a direct effect on grizzly bears and wolves. These animals depend on the caribou as an important food source, as WKSS studies have demonstrated. In 1997-98 the tracked animals revealed a different migration pattern for the Bathurst caribou which took the bulk of the herd east and south of Great Slave Lake. Wolf movement patterns, also collected through the use of satellite collars, followed the caribou route closely.

As with the caribou calving ground studies, WKSS research on wolves and bears has a strong orientation toward habitat. We now have a much better idea of the range of the grizzly bears and are developing a picture of their habitat preferences from season to season.

The grizzly research, and other projects, will benefit from a comprehensive new study using remote sensing data from satellites to develop a vegetation classification for the Study area. This project completed a classification around the Lac de Gras area, began work on the Bathurst caribou calving grounds and will classify a large portion of the WKSS area over the next three years. This habitat information can be combined with movement and location information from various species to assess the importance of different kinds of habitat at different times of year.

The many esker systems which run through the region are a key habitat for both wolves and grizzlies. Male grizzlies use eskers frequently in spring, while females avoid them during the same period; however neither seems to use eskers much for denning. Wolves do commonly den on eskers though. By working cooperatively with another

project looking at the physical characteristics of eskers and traditional knowledge about them, the wolf research will help understand which areas of eskers wolves choose for denning. Eskers are an important source of sand and gravel for construction, so this information will be important in developing ways to best manage the eskers as a resource for industry and as wildlife habitat.

In addition to its links with specific species research, the vegetation classification also has a direct link to a traditional knowledge project looking at Dogrib elders' understanding of wildlife habitat. That study has used analysis of Dogrib place names to define various types of habitat. It is expected that these studies will generate a new kind of habitat map using both the traditional knowledge and remote sensing data.

Aquatic habitat and water quality are also important components of the region's environment. A study using sediment cores from a lake bottom gives a historical picture of changes in the lake environment over the last several hundred years.

Monitoring results from a study of the effects of exploratory drilling from lake ice will feed into the development of regulations about this new technique. Governments, aboriginal organizations, environmental organizations and industry have expressed concern about the lack of data about the environmental effects of such drilling on lake ecosystems. The project has already furnished an accurate picture of the effects of such drilling on water quality and the creatures dwelling on lake bottoms under a number of different conditions.

The Study's many partners in the research agenda have shown a strong commitment to fostering communication and sharing of knowledge among the participants. There is a high level of interest in ways to bring traditional knowledge and science together. This interest is helping people with widely varying backgrounds to learn to work together. The interactions between all the members of the WKSS community are helping to build understanding and cooperative relationships that will serve the evolving north, its environment and its people.

# A Look Ahead

The third year of the Study will be an exciting one. Several more projects will be finishing up and providing final reports on their research. The Partners will be starting to consider the information in relation to achieving sustainable development in the West Kitikmeot / Slave area. A clearer vision of the Study's final outputs will take shape, and there will be a need to step up preparations for the wrap-up in March 2001. We expect that there will be increasing interest in the Study's outputs from Partners, communities, the research community and the interested public.

We will be putting a great deal of effort into ensuring that funds are available to cover all our research commitments.

While the current economic climate makes exploration and development more challenging, the potential of resources in the WKSS area assures interest and activity levels will increase as the economic cycle improves.

All Partners recognize that the collection of strong base-line and follow-up data must proceed regardless of the periodic fluctuations in mineral prices or the overall economy. Any reductions in research at this time might well cause problems and delays in future development activity. The research is essential; the research will continue to be essential. The West Kitikmeot / Slave Study is an excellent, and perhaps a once-only, opportunity

for industry, aboriginal groups and environmental organizations to have their research contributions matched by both the territorial and the federal governments. In this light, we anticipate members of the mineral industry, their suppliers and other interest groups will continue their contributions to WKSS.

A number of our Partners are already making use of WKSS research results. This can only make the Study more attractive to potential contributors. We will be working to further broaden the Study's funding base by increasing the number of contributions and the range of sectors involved.

The Partners' continuing commitment to good research will result in a close watch being kept on new proposals, research project results and the overall direction of the Study. New proposals will be solicited in areas where Partners are concerned about gaps remaining in the Research Priorities. The Research Strategy will be assessed in relation to the evolving nature of the Study and the Partners' needs.

The Partners are placing an increasing priority on communication as research results are released, and the Study has an ongoing commitment to expand the range of ways and means to make our information accessible. We will carry on the use of plain language on our now-established Internet website, newsletters and Annual Report and will be developing tools such as audio and video presentations as well as pursuing opportunities for public presentations and meetings. We will maintain our objective of keeping the media well-informed of our activities as well. The Partners and the Study Office will actively work to make the results accessible and available to the communities in the West Kitikmeot / Slave area through public meetings, direct contact and use of appropriate media and language, including translation.

We will also continue to foster and develop cooperative relationships with the existing territorial government as well as with the institutions which will come into being after division of the Northwest Territories (including the West Kitikmeot / Slave area) which take place at the end of next year. The Partners will forge ahead in actively seeking ways to provide timely and useful research towards achieving sustainable development in this vast region.

The Independent Environmental Monitoring Agency, which oversees BHP's NWT Diamonds Project, came on stream early in 1997 and the Society is seeking ways to complement the Agency's work. The Diavik project has now entered the assessment phase and other projects are moving towards this over the next few months and years. We anticipate that the Study will provide useful information for examining the potential effects of such development, particularly in relation to cumulative effects.

The year ahead looks exciting, challenging and filled with potential. The West Kitikmeot / Slave Study is already playing a useful role in providing decision makers with the best and most up-to-date information available. Access to reliable information is the first critical step in an inclusive decision-making process which strives to ensure that development benefits all the residents of the Study area in a sustainable manner. We fully expect that the year ahead will match and exceed the excellent progress over the last two years.